

REMARKS

Amendments to the Claims

Claims 1-19 are canceled. New claims 20-25 are added. The new claims are fully supported by the specification and figures as originally filed. More specifically, support for new claim 20 is shown in the following table:

Features of Claim 20	Support in Specification
<i>An imaging system for detecting an object on or below a water surface</i>	Page 1, lines 13-16 ("The present invention is in the field of ... multispectral surveillance imaging systems for identifying objects on the surface or under water").
<i>a multispectral optical sensor that separates a received unprocessed image of the object into a first unprocessed image and a second unprocessed image that is spatially and temporally registered with the first unprocessed image</i>	Page 6, lines 4-9 ("The use of the new sensor eliminates the spatial and temporal mis-registration problems inherent in all prior single and multiple device Charge Coupled Device (CCD) and Complimentary Metal Oxide Semiconductor (CMOS) camera designs").
<i>and that generates a first signal corresponding to the first unprocessed image and a second signal corresponding to the second unprocessed image</i>	Page 9, lines 20-24 ("line output for channel X ... line output for a second channel Y").
<i>a processing unit that receives said signals and manipulates said signals by taking a weighted difference of said signals to generate a third signal corresponding to a processed image</i>	Page 11, lines 25-31 ("This weighted output is then subtracted from the other channel by a line subtractor 330 to produce the difference channel line output"). Fig. 3; Fig. 6A; Fig. 6B
<i>a monitor that receives the third signal and displays the processed image</i>	Page 12, lines 13-14 ("the resultant processed imagery can be displayed or transmitted 336 to a remote site for viewing").
<i>wherein the processing unit is operably connected to the multispectral optical sensor and to the monitor</i>	Page 12, lines 15-21
<i>wherein the first unprocessed image is in a first frequency bandwidth and the second</i>	Page 8, lines 17-18 ("a single color water penetrating channel"); Page 9, lines 13-15 ("A

Features of Claim 20	Support in Specification
<i>unprocessed image is in a second frequency bandwidth that is less water-penetrating than the first frequency bandwidth.</i>	second color channel Y can be chosen that is relatively water non-penetrating”).

Support for new claim 21 is found at least in Page 5, line 21 – Page 6, line 2.

Support for new claim 22 is found at least in Page 11, lines 6-13.

Support for new claim 23 is found at least in Page 8, line 25 – Page 9, line 9; Fig. 5.

Support for new claim 24 is found at least in Page 11, lines 15-24.

Support for new claim 25 is found at least in Page 12, lines 1-14.

Accordingly, no new matter is introduced by these amendments.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 3-6 stand rejected under 35 USC § 102(e) as anticipated by Merrill (US 7,164,444). These claims are canceled herein, and therefore these rejections are now moot.

Claims 11 and 15 stand rejected under 35 USC § 102(b) as anticipated by Silva (US 6,304,664). These claims are canceled herein, and therefore these rejections are now moot.

Claim Rejections – 35 U.S.C. § 103

Claim 2 stands rejected under 35 USC § 103(a) as obvious over Merrill (US 7,164,444) in view of Mohan (US 6,005,959). This claim is canceled herein, and therefore this rejection is now moot.

Claims 7-9 stand rejected under 35 USC § 103(a) as obvious over Merrill (US 7,164,444) in view of Mann (US 6,838,651) in further view of Fang (US 5,771,318). These claims are canceled herein, and therefore these rejections are now moot.

Claims 12, 17-18 stand rejected under 35 USC § 103(a) as obvious over Silva (US 6,304,664) in view of Merrill (US 7,164,444). These claims are canceled herein, and therefore these rejections are now moot.

Claims 13-14 stand rejected under 35 USC § 103(a) as obvious over Silva (US 6,304,664) in view of Merrill (US 7,164,444) in further view of Mann (US 6,838,651). These claims are canceled herein, and therefore these rejections are now moot.

Claim 16 stands rejected under 35 USC § 103(a) as obvious over Silva (US 6,304,664) in view of Fang (US 5,771,318). This claim is canceled herein, and therefore this rejection is now moot.

Claim 19 stands rejected under 35 USC § 103(a) as obvious over Silva (US 6,304,664) in view of Mohan (US 6,005,959). This claim is canceled herein, and therefore this rejection is now moot.

The Presently Claimed Invention

The present invention provides an imaging system for detecting an object on or below a water surface. Page 1, lines 13-16. The imaging system uses a multispectral optical sensor to simultaneously receive at least two unprocessed images of the object (and surrounding area) in at least two different bandwidth frequencies. Page 5, lines 21-30. The bandwidth frequencies have different water penetration characteristics. Page 8, lines 17-18; Page 9, lines 13-15. Due to the inherent physical characteristics of the multispectral optical sensor, the at least two unprocessed images are spatially and temporally registered with each other. Page 6, lines 4-11. The sensor converts the two unprocessed images into two signals. Page 9, lines 20-24. The two signals are highly correlated except for the object. Page 9, lines 24-25. The signals are processed to generate a third signal corresponding to a processed image of the object. Page 9, line 25 – Page 11, line 31. The processing at least includes taking a weighted difference of the two unprocessed signals. Page 11, lines 25-31. The third signal is received in a display device which displays the processed image of the object. Page 12, lines 13-14.

The Merrill and Silva Systems Distinguished

The Examiner cited Merrill as anticipating presently canceled independent claim 1, and Silva (US 6,304,664) as anticipating presently canceled independent claim 11.

Merrill does not teach anything about detecting objects on or below a water surface. For at least this reason, Merrill does not anticipate new independent claim 20.

Silva discloses “a de-glinting process that utilizes a two component model to estimate reflected light from the ocean surface and scattered light from the water column below the surface.” Silva 2:19-23. The optical sensor is a “high quality CCD imaging camera.” Silva 3:39-40. However, an inherent problem with using charge coupled device (CCD) sensors for multispectral imaging is that the unprocessed images received by each CCD sensor are not spatially and temporally registered with each other. Page 6, lines 4-11. For at least this reason, Merrill does not anticipate new claim 20.

Conclusion

In light of the foregoing amendments, Applicant believes the claims are now in condition for allowance.


SUMMARY

If the Examiner believes that it would facilitate prosecution, Applicant's attorney, Brooks Gifford III, may be contacted at (619) 544-7208, or at bgifford@gordonrees.com.

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Respectfully submitted,

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